Name: Date:

Polynomial Factoring solution (version 36)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 4x + 24 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(24)}}{2(1)}$$

$$x = \frac{-(4) \pm \sqrt{16 - 96}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{-80}}{2}$$

$$x = \frac{-4 \pm \sqrt{-16 \cdot 5}}{2}$$

$$x = \frac{-4 \pm 4\sqrt{5}\, i}{2}$$

$$x = -2 \pm 2\sqrt{5}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-5 - 2i$ and $-3 - 9i$ in standard form $(a + bi)$.**

Solution

$$(-5 - 2i) \cdot (-3 - 9i)$$

$$15 + 45i + 6i + 18i^2$$

$$15 + 45i + 6i - 18$$

$$15 - 18 + 45i + 6i$$

$$-3 + 51i$$

Polynomial Factoring solution (version 36)

3. **Write function $f(x) = x^3 - 9x^2 + 8x + 60$ in factored form. I'll give you a hint: one factor is $(x - 6)$.**

Solution

	1	-9	8	60
6		6	-18	-60
	1	-3	-10	0

$$f(x) = (x-6)(x^2-3x-10)$$

$$f(x) = (x-6)(x-5)(x+2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+7)^2 \cdot (x+3) \cdot (x-2)^2 \cdot (x-7)^2$$

Sketch a graph of polynomial $y = p(x)$.